CLAIMS

1. A method for establishing a high-speed modem relay connection over a voice frame network between an originating modem with an associated calling-leg gateway and an answering modem with an associated called-leg gateway, the method comprising:

determining at a predeterminedly early time during end-to-end physical layer negotiations between the originating modem and the answering modem whether both modems are high-speed modems, said determining being performed by one or more of the associated gateways, and if so then

terminating end-to-end physical layer negotiations between the originating modem and the answering modem, said terminating being performed by one or more of the associated gateways, and

negotiating local physical layer on either end of the connection between the originating modem and the calling-leg gateway and the answering modem and the called-leg gateway, wherein the calling-leg gateway serves as proxy for the answering modem and wherein the called-leg gateway serves as proxy for the originating modem.

2. The method of claim 1, wherein said determining includes first detecting an amplitude-modulated answer (ANSam) tone at one of the gateways and second detecting a digital call menu (CM) code at the other one of the gateways.

3. The method of claim 1, wherein said determining includes detecting an amplitude-modulated answer (ANSam) tone, said tone-detecting being performed by one or more of the associated gateways, and wherein said determining further includes second detecting a digital call menu (CM) code, said code-detecting being performed by one of the associated gateways, which method further comprises:

signaling, by the first one of the gateways to perform said tone-detecting, of the other one of the gateways that said tone-detecting has occurred.

4. The method of claim 2, wherein said terminating includes suppressing signal transmission between the originating modem and the answering modem.

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5. The method of claim 4, wherein said negotiating includes:

at the calling-leg gateway detecting two additional digital CM codes from the originating modem and completing local calling-leg physical layer negotiation, and

at the called-leg gateway transmitting at least two additional digital CM codes to the answering modem and completing local called-leg physical layer negotiation.

6. The method of claim 2 which, after said first detecting and before said second detecting, further comprises:

disabling voice compression if the same is determined to have been enabled.

7. The method of claim 2 which, after said first detecting and before said second detecting, further comprises:

disabling echo cancellation if the same is determined to have been enabled.

8. A method for establishing a modem relay connection over a voice frame network between an originating modem and an answering modem, the method comprising:

first detecting a predefined modulated answer tone at a first voice frame network gateway corresponding with the answering modem;

second detecting a predefined digital code at a second voice frame network gateway corresponding with the originating modem;

suppressing signal transmission between the originating modem and the answering modem;

at the second gateway detecting two additional predefined digital codes from the originating modem and completing local physical layer negotiation;

at the first gateway transmitting at least two additional predefined digital codes to the answering modem and completing local physical layer negotiation; and

enabling signal transmission between the originating modem and the answering modem,

whereby the voice frame network connection is selectively automatically transitioned from voice mode to modem relay mode upon a determination that the originating modem and the answering modem are both high-speed modems.

9. The method of claim 8 which, after said first detecting and before said second detecting, further comprises:

disabling voice compression if the same is determined to have been enabled.

10. The method of claim 8 which, after said first detecting and before said second detecting, further comprises:

disabling echo cancellation if the same is determined to have been enabled.

11. The method of claim 8 which, after said first detecting and before said second detecting, further comprises:

disabling voice compression if the same is determined to have been enabled; and

disabling echo cancellation if the same is determined to have been enabled.

12. Modem relay connection apparatus for use in a voice frame network gateway to establish a data channel between two modems, the apparatus comprising:

an amplitude-modulated answer (ANSam) tone detector;

a code detector for detecting a digital call menu (CM) code responsive to an amplitude-modulated answer tone;

a signal suppression mechanism responsive to said code detector for suppressing signals between the modems to terminate end-to-end negotiation between the two modems;

a proxy negotiation mechanism responsive to said signal suppression mechanism for negotiating a local physical layer between the gateway and a local one of the two modems.

13. The apparatus of claim 12, which further comprises:

a pass-through invocation mechanism responsive to said tone detector for disabling voice compression if the same is determined to have been enabled and for disabling echo cancellation if the same is determined to have been enabled.

14. The apparatus of claim 12 which further comprises:

a signaling mechanism for signaling a remote gateway upon detection of an amplitude-modulated answer tone by said tone detector.

15. A computer-readable medium containing a program for establishing a high-speed modem relay connection over a voice frame network between an originating modem with an associated calling-leg gateway and an answering modem with an associated called-leg gateway, the program comprising:

instructions for determining at a predeterminedly early time during end-to-end physical layer negotiations between the originating modem and the answering modem whether both modems are high-speed modems, said determining instructions being executed by one or more of the associated gateways, and

instructions for terminating such end-to-end physical negotiations between high-speed modems, said terminating instructions being executed by one or more of the associated gateways; and

instructions for negotiating local physical layer on either end of the connection between the originating modem and the calling-leg gateway and between the answering modem and the called-leg gateway, wherein the calling-leg gateway serves as proxy for the answering modem and wherein the called-leg gateway serves as proxy for the originating modem.

16. The computer-readable medium in accordance with claim 15, wherein said instructions for determining include instructions for first detecting an amplitude-modulated answer (ANSam) tone at one of the gateways and instructions for second detecting a digital call menu (CM) code at the other one of the gateways.

17. The computer-readable medium in accordance with claim 15, wherein said instructions for terminating include instructions for suppressing signal transmission between the originating modem and the answering modem, and wherein said instructions for determining include instructions for first detecting an amplitude-modulated answer (ANSam) tone at one of the gateways and instructions for second detecting a digital call menu (CM) code at the other one of the gateways, which computer-readable medium further comprises:

instructions for signaling, by the first one of the gateways to accomplish tone detection, of the other one of the gateways that tone-detection has occurred.

18. The computer-readable medium in accordance with claim 17, wherein said instructions for negotiating include:

instructions executing at the calling-leg gateway for detecting two additional digital CM codes from the originating modem and for completing local calling-leg physical layer negotiation, and

instructions executing at the called-leg gateway for transmitting at least two additional digital CM codes to the answering modem and for completing local called-leg physical layer negotiation.

19. Apparatus for establishing a high-speed modem relay connection over a voice frame network between an originating modem with an associated calling-leg gateway and an answering modem with an associated called-leg gateway, the apparatus comprising:

means for determining at a predeterminedly early time during end-to-end physical layer negotiations between the originating modem and the answering modem whether both modems are high-speed modems, said determining means being operatively connected with one or more of the associated gateways;

means for terminating end-to-end physical layer negotiations between the originating modem and the answering modem, said terminating means being operatively connected with one or more of the associated gateways, and

means for negotiating local physical layer on either end of the connection between the originating modem and the calling-leg gateway and the answering modem and the called-leg gateway, wherein the calling-leg gateway serves as proxy for the answering modem and wherein the called-leg gateway serves as proxy for the originating modem.

20. The apparatus of claim 19, wherein said determining means includes means for detecting an amplitude-modulated answer (ANSam) tone at one of the gateways and means for detecting a digital call menu (CM) code at the other one of the gateways.